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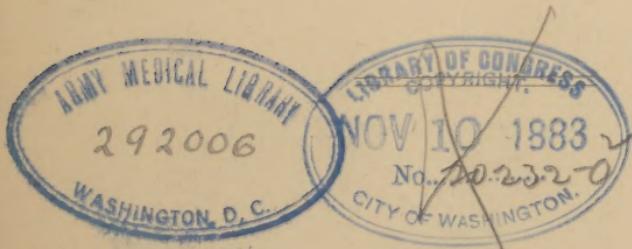
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TO THE

DISSECTION OF THE HUMAN BODY

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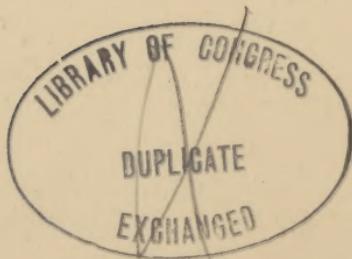
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PREFACE.

Experience has taught me that students, about to enter upon a new field of scientific exploration so complex as that of human anatomy, requiring the most careful manipulation of a variety of delicate structures, are often at a loss to know how to go to work, even after the most diligent study of their text-books and faithful attendance upon the descriptive lectures.

It is therefore in answer to the oft-repeated and anxious inquiries of the earnest students of practical anatomy, "Where shall we begin?" "What ought we to look for?" "What should we do next?" that I have had printed these outlines of my lectures, in order that they may serve as a guide both to preparatory reading and to the actual work upon the cadaver.

It has been my aim in this *order of dissection* to mark out the most practical method by which students in the work required of them might accomplish the purpose with which they set out, *i. e.*, to demonstrate upon *one body* all the important structures which enter into its composition without doing violence to the normal relations of those structures.

The custom, which has been long established in the dissecting-rooms of this University, of assigning one cadaver to four students, permits of a natural division of the body at the diaphragm into *upper* and *lower extremities*. These parts being again divided into right and left give to each student, because of the bilateral symmetry of arrangement, a portion of the body comparatively complete in itself, as, with few exceptions, all structures originating in any one of these divisions may be traced to their termination in the same.

The body thus mapped off into quarters I have further subdivided into *regions* with certain specified limits to which the

student will direct his attention in the order indicated and thus complete the dissection of the structures and organs enumerated in one *region* before passing on to another.

If, in connection with his work thus arranged, the student takes the precaution to inform himself of the contents of each region before undertaking to dissect it, by a careful perusal of some suitable text book he will find at the close of his work, that the purpose with which he set out, not only to know and see what structures are therein contained and their character; but also the relations they sustain to each other, will have been well accomplished.

The blank pages freely interspersed are designed for notes to be made by the student during the progress of his reading and dissection.

It will be found very servicable for all, whether skilled in drawing or not, to use a portion of the space upon these blank pages in making outline sketches of the *regions* with the contained structures in their proper relations.

W. J. HERDMAN.

University of Michigan, Oct. 1883.

TEXTS BOOKS RECOMMENDED FOR THE DISSECTING ROOM WORK.

Holden's Medical and Surgical Landmarks.

Ellis' Demonstrations of Anatomy.

Heath's Practical Anatomy.

Cleland's Dissections.

Masse's Anatomical Plates.

INSTRUMENTS NEEDED BY EACH STUDENT.

Three scalpels (different sizes)

One tenaculum.

One cartilage knife.

One pair scissors.

One chain with hooks.

Two saddler's needles with thread.

One pair dissecting forceps.

Small and large probes (copper wire)

One small blowpipe.

One small whetstone.

INSPECTION OF THE CADAVER.

Before the work of dissecting is begun the body should be subjected to a careful inspection with reference to those *landmarks* upon the surface that serve as guides to the position of important underlying structures. And all orifices, ducts and cavities should be explored as far as possible by means of digital examination, catheters, sounds and probes. The student will be greatly aided in this work by a careful perusal of "Holden's Landmarks." Attention should be especially directed to the following:

Head—

- Contour of skull and bony prominences upon it.
- Position of cranial sutures and fontanelles.
- Limits of cerebrum, cerebellum, and medulla.
- Position of meningeal arteries and venous sinuses.

Face—

- Position and extent of frontal sinuses.
- Lachrymal gland and ducts, puncta lachrymalia, lachrymal sac and nasal duct, Meibomian glands.
- Anterior nares, nasal meati, Eustachian tube, antrum.
- Mouth, orifices of salivary ducts, fauces, pharynx, larynx.
- Ear, external meatus.
- Points of emergence of the branches of 5th cranial nerve.

Neck—

- Median line, hyoid bone, larynx, trachea, thyroid gland.
- Sterno-cleido-mastoid muscle, trapezius muscle, omo-hyoid muscle, digastric muscle.
- Boundaries of surgical triangles.
- Position of carotid arteries and jugular veins, subclavian artery and vein.
- Apex of lung.**
- Transverse process of 6th cervical vertebra.

Thorax—

Outlines of lungs in full inspiration and expiration.

Outlines of the heart and position of the valves.

Attachments of diaphragm.

Back—

Position of spinous process of 7th cervical vertebra.

Position of 3d and 4th, of 8th 9th and 10th spinous processes of dorsal vertebra and their relation to structures interior to thorax.

Position of spine of scapula.

Movements of cervical and dorsal vertebra.

Shoulder—

Movements of the joint.

Relation of head of humerus to acromion and coracoid processes.

Position of axillary artery, vein, brachial plexus of nerves.

Arm—

Position of the brachial artery, basilic and cephalic veins.

Position of median, ulnar, musculo-spiral and musculo-cutaneous nerves.

Elbow—

Movements of joint.

Position and relations of condyles of humerus, olecranon process of ulna and head of radius.

Position of median, musculo-spiral and ulnar nerves.

Veins in front of joint; brachial artery.

Forearm—

Position of radial and ulnar arteries and veins.

Position of median, radial, ulnar and posterior interosseous nerves.

Wrist—

Movements of the joint.

Styloid processes of radius and ulna, pisiform bone.

Position of median, ulnar and radial nerves.

Position of ulnar and radial arteries and veins.

Relations of flexor and extensor tendons.

Hand--

Position of the superficial and deep palmar arches.

Location of the joints of carpus, metacarpus and phalanges.

Movements of these joints.

Abdomen—

Ensiform cartilage of sternum, inner extremity of 9th rib, crest of ilium, anterior superior spine of ilium, symphysis pubes, spine of pubes.

Linea alba, linea semilunaris, linea transversæ, umbilicus.

Locate the outlines of the enclosed viscera with reference to the nine spaces into which this region is usually divided.

Location of external and internal inguinal rings, inguinal canal.

Pelvis—

Anterior, superior and inferior spinous processes of ilium.

Posterior, superior and inferior spinous processes of ilium.

Tuberosity of ischium, great trochanter of femur.

Motions of hip-joint, position of great sacro-sciatic foramen.

Pass sounds and catheters into bladder.

Make digital examination of vagina, uterus, ovaries, fallopian tubes, rectum and prostate gland.

Thigh—

Position of great sciatic, anterior crural and obturator nerves.

Position and boundaries of Scarpa's triangle.

Position of femoral artery and vein.

Knee—

Movements of joint.

Tuberossities of femur, of tibia, tubercle of tibia, styloid process of fibula, patella, ligamentum patella.

Position of popliteal nerves, artery and vein.

Boundaries of popliteal space.

Leg—

Spine of tibia.

Position of anterior tibial artery and nerve.

Position of posterior tibial and peroneal arteries and posterior tibial nerve.

Ankle—

Movements of joint.

Relation to joint of internal and external malleolus.

Position of the anterior and posterior tibial arteries.

Position of the anterior and posterior tibial nerves and musculo-cutaneous nerve.

Position of flexor and extensor tendons.

Foot—

Junction first and second row of tarsal bones, base of first metatarsal, base of fifth metatarsal, tubercle of scaphoid.

Position of dorsalis pedis artery and plantar arch.

Tarso-metatarsal, metatarso-phalangeal, and phalangeal articulations.

REGIONS OF THE UPPER EXTREMITY.

(1) Occipito-frontal. (2) Supra-maxillary (superficial), (3) Infra-maxillary (superficial), (4) External orbital, (5) Calvarial, (6) Encephalic, (7) Internal orbital, (8) Cervical, (9) Infra-maxillary (deep), (10) Pharyngeal, (11) Laryngeal, (12) Supra-maxillary (deep), (13) Internal aural, (14) External thoracic, (15) Axillary, (16) Internal thoracic, (17) Dorsal, (18) Brachial, (19) Anti-brachial, (20) Manual. Ligaments, joints, cartilages and bones.

REGIONS OF THE LOWER EXTREMITY.

(1) Abdominal (external), (2) Abdominal (internal), (3) Perineal, (4) Pelvic, (5) Anterior crural, (6) Lumbar, (7) Gluteal, (8) Posterior crural, (9) Posterior tibial, (10) Plantar (11) Anterior tibial, (12) Dorsal pedal. Ligaments, joints, cartilages and bones.

UPPER EXTREMITY.

(1) Occipito-frontal region.

Remove the integument:—Make a median incision from the occipital protuberance to the root of the nose, through a point midway in this incision make another transversely from ear to ear.

CONTENTS OF THE REGION.

Nerves:—Supra-orbital, supra-trochlear, auriculo-temporal, temporal branches of seventh, small occipital, great occipital.

Vessels:—Supra-orbital, frontal, temporal, posterior auricular, occipital.

Muscles:—Occipito-frontalis, corrugator supercilii.

(2) Supra-maxillary region (superficial).

Remove the integument:—Continue the median incision to the margin of the upper lip and make a transverse incision from the margin of the upper lip to the mastoid process.

CONTENTS OF THE REGION.

Nerves:—Temporal, malar, infra-orbital and posterior auricular branches of seventh; infra-orbital, malar and auriculo-temporal branches of fifth.

Vessels:—Facial, infra-orbital, transverse facial, temporal.
Glands:—Parotid and Steno's duct.

Muscles:—External orbital, group, nasal group, superior labial group.

External Ear:—Muscles, nerves, vessels, cartilages.

(3) Infra-maxillary region (superficial)

Remove the integument:—Make a median incision from the margin of the lower lip to the hyoid bone; another from hyoid bone transversely across the neck.

CONTENTS OF THE REGION.

Nerves:—Buccal, supra-maxillary, infra-maxillary branches

of the seventh; mental mylo-hyoid and muscular branches of the fifth; superficial cervical.

Vessels :—Facial and branches.

Muscles :—Platysma myoides; infra labial group.

(4) External Orbital Region.

CONTENTS OF THE REGION.

Lachrymal apparatus :—Gland, ducts, puncta, canaliculi, sac and nasal duct.

Nerves :—Supra-orbital, infra-orbital, motor-oculi, patheticus, abducens.

Vessels :—Ophthalmic and branches, infaorbital.

Muscles :—Levator palpebrarum, tensor tarsi, superior and inferior oblique, internal and external recti.

The Eye Ball :—To preserve the proper relations of the structures the globe of the eye may be distended with air through a valvular incision or with bits of cotton or sponge. For this dissection the eye ball of one of the lower animals, as, pig, ox, or sheep may be taken and hardened by freezing, by alcohol or solution of bichromate of potash.

(5) Calvarial Region.

Remove the Calvarium :—Saw through the frontal bone transversely midway between the nasal and saggital sutures terminating on either side in the temporal fossa, carry the incision backward from the temporal fossa to the occipital protuberance.

Note :—Pericarnium, structure of skull-cap, markings on its inner surface.

(6) Encephalic Region.

CONTENTS OF THE REGION.

Membranes.

Dura Mater :—Its arrangements and structure.

Venous sinuses, meningeal arteries, falx. Cut the membrane along the margin of the longitudinal sinus and turn it off on either side.

Arachnoid :—Its arrangement and structure.

Pia Mater :—Its arrangement and structure, cerebral arteries and veins. Remove it carefully from the surface of the cerebrum.

CEREBRUM.

Its hemispheres, its lobes, its fissures, its sulci, its convolutions.

Remove the surface of the hemispheres by successive slices down to the level of the corpus collosum noting the relative amount and arrangement of white and grey substance.

Corpus Collosum :—Raphe; nerves of Lancisi. Cut through corpus collosum and open the

Lateral Ventricle :—Septum lucidum; corpus striatum; foramina of Munro; tenia semicircularis; optic thalamus; choroid plexus; fornix; anterior cornu; middle cornu; hippocampus major; pes hippocampi; corpus fimbriatum; fascia dentata; posterior crus of the fornix; choroid plexus; posterior cornu; hippocampus minor.

Fifth Ventricle.

Remove the fornix and expose the velum interpositum; veins of Galen; transverse fissures; pineal gland and its peduncles.

Third Ventricle :—Posterior, middle and anterior commissures; entrance to aqueduct of Sylvius.

Corpora geniculata; corpora quadrigemina; valve of Vieussens; superior crura of cerebellum. The anterior and middle lobes of the cerebrum may now be raised gently and turned backward and the following structures on the under surface noted; olfactory nerves; optic nerves, commissures and optic tract; ophthalmic arteries; pituitary body and infundibulum; third pair nerves corpora albancantia; fourth pair nerves; circle of Willis.

Cut through the crura cerebri and the superior crura of the cerebellum on a level with the tentorium and remove the cerebrum. The locus niger is exposed by the cut. Tentorium; straight, lateral and superior petrosal sinuses.

Remove the tentorium by severing it at its margins and expose the

CEREBELLUM. (Superior surface.)

Pia Mater :—Hemispheres; lobes; incisura anterior and posterior.

PONS VAROLII.

Turn backward the pons exposing its under surface; fifth pair nerves.

MEDULA OBLONGATA.

Sixth, seventh, eighth, ninth, tenth, eleventh and twelfth pairs of nerves.

Cut the spinal cord across as low down in the canal as possible and remove the pons, medulla and cerebellum when their external surfaces and internal structure can be more minutely examined.

BASE OF THE SKULL.

Venous sinuses; foramina for passage of nerves and vessels; bones; anterior, middle and posterior fossa; grooves and sutures.

(7) Internal Orbital Region.

Saw through the orbital plate of frontal bone and lesser wing of sphenoid just external to the median line of the base of the skull. Make another incision from the outer extremity of sphenoidal fissure to the outer margin of the orbit. Carefully remove the piece of bone thus detached and cut through the dura-mater lining the orbit.

CONTENTS OF THE REGION.

Nerves:—Ophthalmic and branches; motor oculi and branches; patheticus; optic; abducens; lenticular ganglion of the sympathetic and ciliary branches.

Arteries and veins:—Ophthalmic and branches.

Muscles:—Levator palpebrae; superior rectus; superior oblique and pulley; inferior oblique; inferior rectus; external rectus; tensor tarsi.

Lachrymal Apparatus:—Gland; ducts; puncta lachrymalia; canaliculi, lachrymal sac; nasal duct. Meibomian glands; tarsal cartilages; tendo oculi.

Eye-ball. See *External Orbital Region.*

(8) Cervical Region.

Remove the Integument:—Continue the incision through the integument along the median line of the neck from the

hyoid bone to the sternum, then outward along the clavicle to the acromian process of the scapula.

SUPERFICIAL CONTENTS:—

Nerves:—Superficial cervical plexus.

Vessels:—External jugular and anterior jugular veins.

Muscles:—Platysma myoides.

DEEP CONTENTS:—

Surgical triangles i. e., sub-maxillary; superior carotid; inferior carotid; sub-clavian; sub-occipital.

SUB-MAXILLARY TRIANGLE:—

Boundaries:—

Contents:—

Nerves:—Mylo-hyoid; hypo-glossal; glosso-pharyngeal; gustatory; chorda tympani; sub-maxillary ganglion of sympathetic.

Arteries and Veins:—Lingual and facial and their branches.

Glands:—Sub-maxillary gland and Wharton's duct. Lymphatic glands.

Muscles:—Elevators of the hyoid bone.

SUPERIOR CAROTID TRIANGLE.

Boundaries:—

Contents:—

Nerves:—Hypo-glossal and descendens noni; communicans noni; pneumogastric, superior laryngeal, external laryngeal; sympathetic.

Arteries:—

Common carotid	External carotid { Ascending pharyngeal; sup. thyroid; occipital; lingual; facial. Internal carotid.
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Veins:—Internal jugular and branches.

Muscles:—Anterior spinal group.

INFERNOR CAROTID TRIANGLE:—

Boundaries:—

Contents:—

Nerves:—*Descendens noni; communicans noni; pneumogastric, recurrent laryngeal; sympathetic and branches.*

Arteries and Veins:—*Common carotid artery; internal jugular vein; superior thyroid artery and vein; inferior thyroid artery and vein; sometimes thyroidea ima artery.*

Thyroid Gland.

SUB-CLAVIAN TRIANGLE.

Boundaries:—

Contents:—

Nerves:—*Brachial plexus and branches; phrenic.*

Arteries and Veins:—*Sub-clavian vein and artery and branches.*

Apex of the lung.

Lymphatic glands.

Muscles:—*Scaleni.*

SUB-OCCIPITAL TRIANGLE.

Boundaries:—

Contents:—

Nerves:—*Deep cervical plexus; spinal accessory.*

Arteries and Veins:—*Transversalis colli.*

Lymphatic glands.

Muscles:—*Splenius capitis et colli; levator anguli scapulae; scaleni.*

DEEP CERVICAL FASCIA.

(9) Infra-maxillary Region (deep).

Muscles of mastication:—Dissect off the masseter and temporal muscles and remove one side of the lower jaw by disarticulating at the condyle and sawing through the body of the jaw back of the mental foramen; cut off close to the bone the structures attached to the under surface.

CONTENTS OF THE REGION.

Nerves:—*Gustatory; inferior dental; glosso-pharyngeal; hypo-glossal; otic ganglion of sympathetic; muscular branches to muscles of mastication.*

Arteries and Veins:—*Internal maxillary and branches; lingual and ranine.*

Glands:—Sub-maxillary; sub-lingual; tonsils.

Muscles:—Extrinsic and intrinsic muscles of the tongue.
Teeth.

(10) Pharyngeal Region.

CONTENTS OF THE REGION.

Nerves:—Glossopharyngeal; pharyngeal branches of pneumogastric; palatine from Meckel's ganglion.

Arteries and Veins:—Internal maxillary and branches; ascending pharyngeal; internal carotid.

Muscles:—Constrictors; stylo-pharyngeus; muscles of the soft palate.

(11) Laryngeal Region.

CONTENTS OF THE REGION.

Nerves:—Superior laryngeal, lateral laryngeal, recurrent laryngeal branches of pneumogastric.

Arteries and Veins:—Superior and inferior thyroid.

Muscles:—Crico-thyroid; arytenoideus; crico-arytænoidenus posticus; crico-arytænoides lateralis; thyro-arytænoideus.

Vocal Cords:—False and true.

Sacculus laryngis.

Epiglottis.

Cartilages of larynx and trachea.

To examine the posterior surface of the larynx the muscles of the pharynx and the oesophagus should be slit down upon one side and the larynx rotated outward. To examine the interior of the larynx make a longitudinal incision through the median line of its posterior wall.

(12) Supra-maxillary Region.

Saw through the bones of the skull, vertically, laying open the nasal fossa close to the septum.

CONTENTS OF THE REGION.

Superior, middle and inferior meatus; openings into each; Eustachian tube.

Nerves:—Olfactory; Meckel's ganglion and branches;

Vidian; nasal branch of ophthalmic; posterior and anterior dental.

Arteries and Veins:—Internal maxillary branches.

Muscles:—Levator palati; tensor palati.

Cavities:—Antrum of Highmore; ethmoid and sphenoid cells; frontal sinuses.

(13) Internal Aural Region.

Cut away the parts of the temporal and sphenoid bones lying in front of the Eustachian tube and external auditory canal, open into the middle ear, or tympanum, by cutting away its anterior wall and that of the Eustachian tube.

CONTENTS OF THE REGION.

Membrana tympani.

Bones:—Malleus; incus; stapes.

Nerves:—Facial and chorda tympani; great and small superficial petrosal; Jacobson's.

Arteries:—Branches of internal maxillary, of posterior auricular, of middle meningeal, of ascending pharyngeal, and of internal carotid.

Veins:—Correspond with the arteries and empty into the meningeal and pharyngeal.

Muscles:—Tensor tympani; laxator tympani; stapedius.

The internal ear or labyrinth may be laid open through the internal auditory meatus by means of a fine saw or bone forceps.

CONTENTS.

Semicircular canals; cochlea.

Nerves:—Auditory.

Vessels:—Internal auditory; stylo-mastoid.

A more minute and thorough dissection of the AURAL REGION may be made on specially prepared specimens.

(14) External Thoracic Region.

Remove the integument:—Continue the incision along the median line of the sternum to the ensiform cartilage and dissect the integument outward over the shoulder.

CONTENTS OF THE REGION.

Nerves:—Upper intercostal branches; intercosto-humeral; external and internal anterior thoracic.

Arteries and Veins :—Superior thoracic; external thoracic; intercostal; branches of internal mammary.

Glands :—Mammary gland.

Muscles :—Pectoralis major; pectoralis minor; sub-clavius; external and internal intercostal.

Costo-coracoid membrane.

(15) Axillary Region.

Remove the integument :—From the shoulder; disarticulate the clavicle from the sternum and turn it outward holding it by hooks and chain.

Boundaries of the axilla.

CONTENTS :

Nerves :—Brachial plexus and branches; posterior thoracic.

Arteries and Veins :—Axillary and branches; cephalic vein.

Glands :—Axillary.

Muscles :—Pectoralis major and minor; sub-scapularis; teres major and minor; serratus magnus; latissimus dorsi.

(16) Internal Thoracic Region.

With a cartilage knife or bone forceps cut through the costal cartilages near their costal extremities. Remove the sternum and costal cartilages.

ANTERIOR MEDIASTINUM :

Boundaries :

CONTENTS :

Vessels :—Left internal mammary.

Glands :—Remains of the thymus gland.

Muscles :—Left triangularis sterni; origins of sterno-hyoid and sterno-thyroid.

PERICARDIUM AND HEART.

Note the extent of the pericardium; its structure. Distend it with air through a valvular incision. Open it by a crucial incision. The heart may be dissected in place or its vessels cut at the limits of the pericardium and the organ dissected external to the body.

Nerves:—Anterior and posterior cardiac plexuses; ganglia.
Arteries:—Pulmonary; aorta; coronary.

Veins:—Superior and inferior vena cava; pulmonary veins; coronary sinus; right and left coronary; foramina Thebesii.

Cavities:—Right and left auricles; right and left ventricles.

Valves:—Tricuspid; semilunar of pulmonary artery; mitral; semilunar of aorta.

Walls:—Structure and thickness; columnae carnei; trabeculae carnei; musculi papillares; chordæ tendineæ; Eustachian valve; location of foramen ovale.

Ductus arteriosus.

In opening into the interior of the heart the incisions should follow the course the currents of blood have taken. This dissection should be repeated on the fresh heart of one of the lower animals, as the ox.

In addition to the heart and pericardium the following structures should be sought for and examined in the middle mediastinal space.

Nerves:—Phrenic.

Vessels:—Arch of aorta and branches; right and left pulmonary arteries; pulmonary veins; superior vena cava and branches.

Trachea.

PLEURA AND LUNGS.

Arrangement of the pleural sacs. Dilate the lungs; structure.

Lobes.

Nerves:—Pneumogastric and sympathetic forming anterior pulmonary plexus and posterior pulmonary plexus.

Arteries and Veins:—Pulmonary; bronchial.

Lymphatics.

Bronchi.

Air cells.

After the lungs are examined and distended in place they may be separated from their attachments at the roots and ligamentum latum and the dissection completed external to the body.

POSTERIOR MEDIASTINUM.

Boundaries.

CONTENTS.

Nerves :—Pneumogastric; splanchnic.

Arteries and Veins :—Descending aorta and branches; left superior intercostal vein; greater and lesser azygos veins.

Lymphatics :—Glands and thoracic duct.

Æsophagus.

INTERIOR OF WALLS OF THORAX:

Nerves :—Intercostal; sympathetic.

Vessels :—Intercostal.

Muscles :—Intercostal; diaphragm.

(17) Dorsal Region.

The disectors of both upper and lower extremities should unite in the dissection of the superficial layers of this region.

Remove the integument from the base of occiput to the crest of the ilium and search in the superficial fascia for the cutaneous branches of the posterior divisions of the spinal nerves. The remaining structures may then be exposed and examined in the following order:

Muscles :—Trapezius; latissimus dorsi.

In removing these muscles cut them through near their attachment to the spinous processes of the vertebra.

Nerves :—Spinal accessory.

Arteries and Veins :—Superficial cervical.

Muscles :—Rhomboideus major and minor; levator anguli scapulae.

These may be cut at their spinal attachments and turned outward toward the scapula.

Nerves :—Branches of fifth spinal nerve.

Arteries and Veins :—Posterior scapular.

Vertebral and lumbar aponeurosis.

Muscles :—Serratus posticus superior; serratus posticus inferior; splenius; serratus magnus.

Nerves :—Occipitalis major and minor; posterior spinal roots.

Arteries and Veins :—Occipital; deep cervical; dorsal branches of intercostal.

The above muscles being removed there is exposed the

Fourth layer of Muscles :—Erector spinae; ileo-costalis;

musculus accessorius ad ileo-costalem; cervicalis ascendens; longissimus dorsi; transversalis cervicis; trachelomastoid; spinalis dorsi; complexus.

Fifth layer of Muscles:—Multifidus spinae; semi-spinalis dorsi and colli; rotatores spinae; intertransversales; interspinales; rectus capitis posticus major; rectus capitis posticus minor; obliquus capitis inferior; obliquus capitis superior.

Nerves:—Sub occipital; great occipital; posterior spinal.

Arteries and Veins:—Vertebral.

SPINAL CORD.—Removing the muscles from the spinal column the lamina of the vertebra should be cut through at their outer extremities inclining the saw or chisel toward the median line; the spinous processes and lamina may then be detached from the upper cervical to the lower sacral vertebra.

MEMBRANES.

Dura-mater and prolongations.

Remove the spinal cord and membranes entire by severing the attachments of the dura-mater to the anterior and lateral walls of the canal.

Open the dura-mater by a median incision along its anterior surface. Anterior and posterior roots of spinal nerves; ligamentum denticulatum; arteries and veins.

Arachnoid:—Parietal and visceral layers and sub-arachnoid space.

Pia-mater:—Vessels; linea splendens.

Structure of the Cord:—Make transverse sections through cervical, dorsal and lumbar portions.

DORSAL SURFACE OF THE SCAPULA.

Muscles:—Deltoid; supra-spinatus; infra-spinatus; teres major; teres minor.

The deltoid should be cut across near its humeral insertion in order that the insertions of the remaining muscles may be exposed.

Nerves:—Supra-scapular; circumflex; sub-scapular.

Arteries and Veins:—Supra-scapular; posterior scapular dorsalis scapulae; anterior and posterior circumflex.

(18) Brachial Region.

Remove the integument from the shoulder to the elbow and in the superficial fascia dissect out, viz:—

Nerves :—Intercosto-humeral; nerve of Wrisberg; internal cutaneous; circumflex; cutaneous branches of musculo-spiral.

Veins :—Cephalic; basilic; median-cephalic; median-basilic.

Remove the superficial fascia and search for the following structures in the order given:

Arteries :—Brachial artery and branches.

Veins :—Brachial venæ comites and branches corresponding to the arteries.

Nerves :—Median; ulnar; musculo-cutaneous; musculo-spiral.

Muscles :—Coraco-brachialis; biceps; brachialis anticus; triceps; anconeus; origin of supinator longus; extensor carpi radialis longior; common tendon of the flexors of the hand.

(19) Anti-Brachial Region.

Remove the integument from the elbow to the wrist and search in the superficial fascia for, viz:—

Cutaneous Nerves :—External cutaneous; internal cutaneous; external cutaneous of musculo-spiral.

Veins :—Radial; ulnar; median.

Removing the superficial fascia search for, viz:—

Nerves :—Median and branches; ulnar and branches; radial; posterior interosseous and branches.

Arteries and Veins :—Radial and branches; ulnar and branches.

Muscles :

Flexors of the wrist	Flexor carpi radialis; Flexor carpi ulnaris; (Palmaris longus.
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Flexors of the fingers	Flexor sublimis digitorum; Flexor profundus digitorum. Flexor longus pollicis.
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Pronators	Pronator radii teres; Pronator quadratus.
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Supinators	{ Supinator longus; Supinator brevis.
Extensors of the wrist	{ Extensor carpi radialis longior; Extensor carpi radialis brevior; Extensor carpi ulnaris.
Extensors of the fingers	{ Extensor communis digitorum; Extensor indicis; Extensor minimi digiti.
Extensors of the thumb	{ Extensor primi internodii pollicis; Extensor secundi internodii pollicis; Extensor ossis metacarpi pollicis.

(20) Manual Region.

DORSAL SURFACE.

Remove the integument from the wrist to the tips of the fingers.

Nerves:--Radial; ulnar; gangliform enlargement of the posterior interosseous.

Arteries and Veins:--Radial; posterior carpal. of ulnar and radial; dorsal interossei; digital; dorsalis indicis; dorsalis pollicis.

Muscles: -Insertions of the tendons of the long extensors of the wrist and digits; dorsal interossei.

PALMAR SURFACE.

Remove the integument from the wrist to the tips of the fingers.

Nerves:--Musculo-cutaneous; superficial branches of median and ulnar.

Arteries and Veins: Superficialis volae; ulnar; superficial palmar arch; digital; radialis indicis; princeps pollicis.

Palmar Fascia:--Clean, and remove it by a median incision.

Nerves:--Deep branches of median and ulnar; anterior interosseous.

Arteries and Veins:--Deep palmar arch; interossei.

The deep tendons need not be cut across in order to expose the structures underneath but can be turned out over the pisiform bone.

Muscles:—Insertions of the long flexor tendons of the wrist and digits;

of the thumb	Abductor pollicis; Opponens pollicis; Flexor brevis pollicis; Adductor pollicis. Palmaris brevis;
of the little finger	Abductor minimi digiti; Flexor brevis minimi digiti; Opponens minimi digiti.

Lumbricales. Four.

Palmar interossei. Three.

THE SKELETON.

The bones, cartilages and ligaments should now be studied and in their order the structures entering into the following

Articulations:—Vertebral, dorsal and cervical; atlas with axis; axis with occipital bone; temporo-maxillary; ribs with vertebra and with sternum and ensiform cartilage; intercostal; sterno-clavicular; shoulder joint; elbow joint; radio-ulnar; wrist joint; carpal; carpo-metacarpal; metacarpo-phalangeal; phalangeal.

LOWER EXTREMITY.

(1) External Abdominal Region.

The dissection of this region is greatly facilitated by distending the peritoneal cavity with air through a perforation made at the umbilicus.

Remove the integument by making a long median incision from the ensiform cartilage to the symphysis pubes and two transverse incisions, one uniting the anterior superior spines of the ilia and the other on a line through the anterior extremities of the ninth ribs. This gives upon either side of the median line two triangular and one quadrilateral flap which should be dissected back so as to fully expose the limits of the external oblique muscle. Search for the following structures in the

Superficial fascia.

Nerves:—Intercostal; ilio-hypogastric; ilio-inguinal.

Arteries and Veins:—Intercostal; superficial epigastric; superficial circumflex iliac.

Muscles:—External oblique. In connection with this muscle Note Poupart's ligament, Gimbernat's ligament and external abdominal ring. In removing this muscle the transverse incisions should correspond with those through the integument. The longitudinal incision should be about an inch exterior to the linea semi-lunaris.

Rectus abdominis:—The sheath of this muscle should be divided by a longitudinal and several transverse incisions and the muscle uncovered; after being examined in position it should be divided midway and turned out of its sheath. In its substance are the following

Arteries and Veins:—Internal mammary; deep epigastric

Pyramidalis muscle:—Detach at apex and turn downward

Internal Oblique:—Divide it in same manner as external oblique. *Note.* Inguinal canal; internal inguinal ring; spermatic cord or round ligament; conjoined tendon.

Transversalis:—No attempt need be made to separate this muscle from the transversalis fascia and peritoneum. *Note* deep circumflex iliac artery and vein.

Transversalis fascia:—At this stage of the dissection the student should give attention to the anatomical relations and coverings of the various forms of abdominal hernia.

In opening into the abdominal cavity a longitudinal incision should be made through the remaining structures of its anterior wall a little to one side of the median line, and a transverse incision on a level with the umbilicus.

(2) Internal Abdominal Region.

CONTENTS OF THE REGION.

Obliterated foetal structures:—Hypogastric arteries; umbilical vein; urachus.

Location of viscera.

Distribution of the peritoneum.

Arteries and Veins:—Phrenic; coeliac axis and branches; superior mesenteric; inferior mesenteric; renal; spermatic or ovarian; portal vein; abdominal aorta; inferior vena cava.

Lymphatics:—Glands and ducts.

Nerves:—Pneumogastric; sympathetic plexuses and ganglia.

Viscera:—Stomach; duodenum; jejunum; ileum; caecum; ascending colon; transverse colon; descending colon; sigmoid flexure.

NOTE.—Each portion of the digestive tract should be examined in the order above mentioned, first in place, then removed (with the exception of the duodenum) and their internal structure examined. The duodenum should be left in place until the liver and pancreas are examined.

Spleen; liver; pancreas; one kidney and supra-renal capsule. The other kidney should be left until its associate organs in the pelvic cavity are dissected.

In examining the large glandular organs their interior structure is best shown by opening along the vessels and ducts which enter into them.

After the removal of the viscera the nerves and vessels on the posterior wall of the cavity can be more minutely dissected.

Nerves:—Pneumogastric; great and lesser splanchnic; semi-lunar ganglia; solar plexus; sympathetic cord, glangia and plexuses; communicating branches from the spinal cord.

Arteries and Veins:—Abdominal aorta and branches; inferior vena cava and branches; azygos vein.

Lymphatics:—Receptaculum chyli and thoracic duct.

Muscles:—Diaphragm; psoas magnus and parvus; iliacus.

(3) Perineal region.

The knees should be flexed upon the abdomen and fixed with cords in this position; the hips should be elevated upon a block and brought to the end of the table.

Remove the integument by median and transverse incisions intersecting at a point one inch anterior to the anus.

ISCHIO-RECTAL FOSSA.

Nerves:—Internal pudic and branches.

Arteries and Veins:—Hemorrhoidal; internal pudic and branches.

Muscles:—External and internal sphincter ani; levator ani; transversus perinæi.

PERINÆUM PROPER.

Superficial layer of structures.

Nerves:—Superficial perineal; inferior pudendal.

Arteries and Veins:—Transverse perineal; superficial perineal.

Muscles:—Ejaculator or accelerator urinæ; transversalis perinæi; erector penis.

In Female:—Crompressor bulbæ; constrictor vaginæ; erector clitoridis.

Deep fascia and triangular ligament.

Deep layer of structures.

Nerves:—Deep perineal; dorsal branch to penis or clitoris.

Arteries and Veins:—Pudic; to bulb; to Cowper's gland; dorsal of penis; cavernous.

In Female :—Of the bulb; of crus clitoridis; of dorsum of clitoris.

Muscles :—Deep transversalis perinei; constrictor urethrae.

In Female :—Constrictor vagina; muscle of Jarjavay.

Glands :—Cowper's; prostate; *In Female* :—Bartholin's.

SCROTUM AND SPERMATIC CORD.

Demonstrate the following structures: Skin; dartos; intercolumnar fascia; cremasteric fascia;

Nerves :—Genital branch of genito-crural.

Arteries and Veins :—Cremasteric.

Fascia propria; tunica vaginalis; vas deferens.

Nerves :—Spermatic plexus.

Arteries and Veins :—Spermatic; deferens.

Lymphatics :—Glands and ducts.

TESTIS.

In connection with this organ the following parts should be observed.

Tunica vaginalis propria; tunica albuginea; epididymis. Make vertical and transverse incisions through the testis noting its internal structure, *i.e.* septa; lobules; vasa recta; mediastinum; rete testis; vasa efferentia.

PENIS.

Remove the integument and distend the corpora cavernosa by air through a valvular incision:—Corpora cavernosa; corpus spongiosum; urethra.

Nerves :—Branches of internal pudic and hypogastric plexus.

Arteries :—Branches of internal pudic.

Veins :—Branches of internal pudic and prostatic plexuses.

(4) Pelvic Region.

Distribution of the peritoneum in the pelvic cavity and upon the pelvic viscera; cul de sac of Douglas. Distribution of the pelvic fascia.

Nerves :—Hypogastric plexus of sympathetic.

Arteries and Veins :—Internal iliac and branches.

Bladder :—Ligaments; ureters; urethra; trigone; nerves; vessels; structure of walls; prostate gland; vas deferens; vesicula seminales.

The bladder should be carefully separated from its attachments in the pelvis and removed.

Vagina and Uterus :—Ligaments; ovaries; Fallopian tubes; nerves and vessels.

Remove these organs from their attachments in the pelvis and lay open their interior cavities noting their structural arrangement.

Rectum :—Ligaments; nerves; arteries and veins; structure.

Nerves :—Sacral plexus and branches; sympathetic.

Arteries and Veins :—Internal iliac and branches.

Muscles :—Obturator internus; pyriformis.

(5) Anterior Crural Region.

Remove the integument from the anterior surface of the thigh as far as the knee joint by an incision from the middle of the crest of the ilium to the external condyle of the femur and from the external condyle to the internal condyle below the patella leaving the flap attached along the inner margin of the thigh. Search in the superficial fascia for, viz:—

Nerves :—External, middle and internal cutaneous branches.

Veins :—Internal saphenous and branches.

Glands :—Lymphatics.

Femoral hernia :—Position and coverings.

Scarpa's Triangle :—Boundaries and contents.

Nerves :—Anterior crural and branches; crural branch of genito-crural.

Arteries and Veins :—Femoral artery and vein and branches.

Hunter's Canal.

Muscles :—Sartorius; tensor vagina femoris; quadriceps extensor.

INNER SURFACE OF THIGH.

Nerves :—Obturator and branches.

Arteries and Veins :—Obturator and branches.

Muscles :—Psoas; iliacus; pectineus; gracilis; adductor brevis; adductor longus; adductor magnus.

(6) Lumbar Region.

This region should be dissected while the dissectors on the UPPER EXTREMITY are engaged on the DORSAL REGION.

Remove the integument from the lower ribs to the crest of the ilium and search in the superficial fascia for, viz:

Nerves :—Posterior branches of the spinal nerves.

Arteries and Veins :—Terminal branches of the lumbar vessels.

Lumbar fascia.

Muscles :—Latissimus dorsi; erector spinae; quadratus lumborum.

The lumbar and sacral portion of the spinal canal should be opened according to the directions given in the DORSAL REGION. The spinal column may now be disarticulated at the junction of the last dorsal and first lumbar vertebra and the LOWER EXTREMITIES separated from the UPPER. The LOWER EXTREMITIES may also, at this stage of the dissection, be separated from each other by sawing through the bones of the pelvis in the median line of the body.

(7) Gluteal Region.

Remove the integument along the median line to the tip of the coccyx then outward below the fold of the buttock to a point three inches below the base of the great trochanter of the femur. Search in the superficial fascia for, viz:

Nerves :—Lateral branches of last dorsal; iliac branches of ilio-hypogastric and ilio-inguinal; posterior branches of sacral; small sciatic.

Muscle :—Gluteus maximus.

The tendon of this muscle should be severed near its attachment to the femur and fascia lata and turned backward.

Nerves :—Superior gluteal; great sciatic; small sciatic; internal pudic.

Arteries and Veins :—Gluteal; sciatic; internal pudic; internal circumflex.

Muscles :—Gluteus medius; gluteus minimus; pyriformis; gemellus superior; obturator internus; gemellus inferior; obturator externus; quadratus femoris.

(8) Posterior Crural Region.

Remove the integument from the fold of the buttock to the lower extremity of the popliteal space.

Nerves:—Small sciatic and branches; great sciatic and branches: articular branch of obturator.

Arteries and Veins:—Sciatic; internal circumflex; perforating.

Muscles:—Biceps; semi-membranosus; semi-tendonosus; adductor magnus; gracilis.

POPLITEAL SPACE.

Nerves:—Small sciatic branches; great sciatic and branches; articular branch of obturator.

Arteries and Veins:—Popliteal and branches.

Muscles:—Those bounding the space.

Lymphatic glands.

(9) Poster Tibial Region.

Remove the integument from the popliteal space to the malleoli by an external and internal lateral incision and search in the superficial fascia for

Nerves:—External saphenous; internal saphenous; communicans peronei.

Veins:—External saphenous; internal saphenous.

Muscles:—Gastrocnemius; soleus; plantaris.

Sever the tibial attachment of the soleus muscle close to the bone and turn this superficial layer of muscles outward; if the gastrocnemius muscle is very massive its inner head may also be cut across.

Nerves:—Posterior tibial and branches.

Arteries and Veins:—Posterior tibial and branches; peroneal and branches.

Muscles:—Popliteus; flexor longus digitorum; tibialis posterior; flexor longus pollicis; peroneus, longus and brevis.

(10) Plantar Region.

Remove the integument from the sole of the foot by incision along the outer and inner margins of the foot from the malleoli to the extremities of the great and lesser toes.

Plantar fascia:—Sever it from its attachment to the os calcis and turn it forward to the base of the digits.

Nerves:—External and internal plantar and branches.

Arteries and Veins :—External and internal plantar and branches.

Muscles :—

First layer	$\left\{ \begin{array}{l} \text{Abductor pollicis;} \\ \text{Flexor brevis digitorum;} \\ \text{Abductor minimi digiti;} \end{array} \right.$
Tendon of Flexor longus digitorum;	
Tendon of Flexor longus pollicis;	
Second layer	$\left\{ \begin{array}{l} \text{Accessorius;} \\ \text{Lumbricales—four;} \\ \text{Flexor brevis pollicis;} \end{array} \right.$
Third layer	$\left\{ \begin{array}{l} \text{Adductor pollicis;} \\ \text{Transversis pedis;} \\ \text{Flexor brevis minimi digiti;} \end{array} \right.$

Fourth layer : Plantar interossei—three.

Nerves :—Deep branches of internal and external plantar.

Arteries and Veins :—Plantar arch; communicating branch from dorsalis pedis; digital.

Insertions of tendons of the long flexors, peroneus longus and brevis, and tibialis posticus and anticus.

(11) Anterior Tibial Region.

Remove the integument from the knee-joint to the ankle and search in the superficial fascia for, viz :—

Nerves :—Branches of internal saphenous; branches of external popliteal; branches of musculo-cutaneous.

Veins :—Branches of internal and external saphenous.

Muscles :—Tibialis anticus; flexor longus digitorum; flexor longus pollicis; peroneus tertius.

Nerves :—External popliteal; anterior tibial; musculo-cutaneous.

Arteries and Veins :—Anterior tibial and branches; anterior peroneal.

Annular ligament of ankle-joint.

(12) Dorsal pedal Region.

Remove the integument from the ankle-joint to the tips of toes and search in the superficial fascia for, viz :

Nerves :—External and internal saphenous branches; musculo cutaneous branches;

Veins :—Branches of internal and external saphenous,

Deep Nerves:—Branches of musculo-cutaneous and anterior tibial.

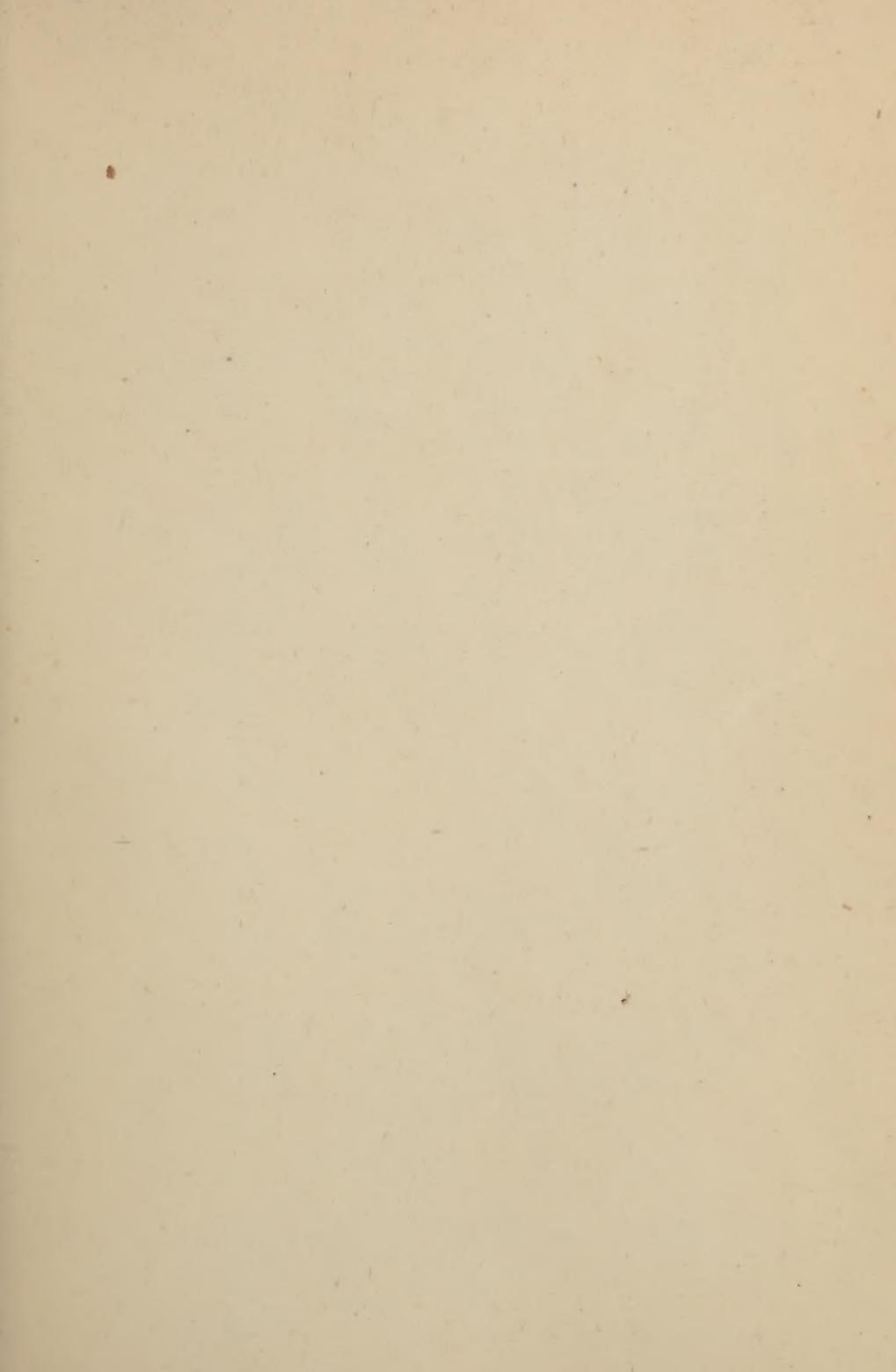
Deep Arteries and Veins:—Dorsalis pedis; tarsal; metatarsal; communicating; dorsalis hallucis; digital.

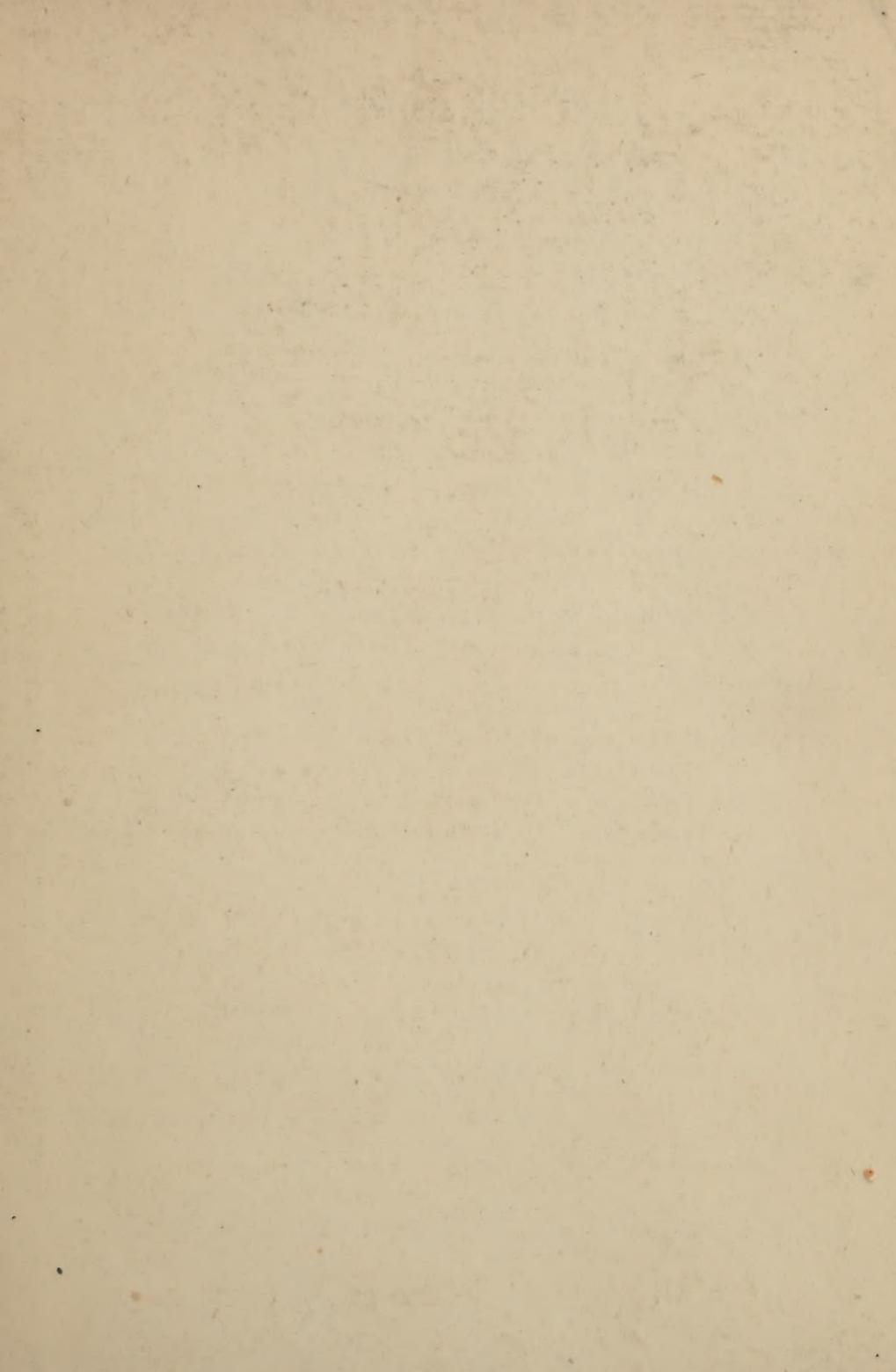
Muscles:—Tendons of the long extensors; extensor brevis digitorum; dorsal interossei—four.

THE SKELETON,

The bones and cartilages of the LOWER EXTREMITY should now be studied and the parts entering into the following

Articulations:—Intervertebral; pelvis with spine; sacrum with coccyx; sacrum and ischium; inter-pubic; hip-joint; knee-joint; tibia with fibula; ankle-joint; tarsal; tarso-metatarsal; metatarsal; metatarso-phalangeal; phalangeal.





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